AD-A237 040



(2)

A RAND NOTE

Aggregate Dynamic Analysis Model (ADAM) for Air Force Enlisted Personnel: User's Guide

William T. Mickelson, C. Peter Rydell

December 1989

91-02505



RAND

91

The research reported here was sponsored by the United States Air Force under Contract F49620-86-C-0008. Further information may be obtained from the Long Range Planning and Doctrine Division, Directorate of Plans, Hq USAF.

The RAND Publication Series: The Report is the principal publication documenting and transmitting RAND's major research findings and final research results. The RAND Note reports other outputs of sponsored research for general distribution. Publications of The RAND Corporation do not necessarily reflect the opinions or policies of the sponsors of RAND research.

Published by The RAND Corporation
1700 Main Street, P.O. Box 2138, Santa Monica, CA 90406-2138

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER N-3020/1-AF	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Aggregate Dynamic Analysis Model (ADAM) for Air Force Enliseted Personnel: User's Guide		5. TYPE OF REPORT & PERIOD COVERED interim 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) W. T. Mickelson, C. P. Rydell		8. CONTRACT OR GRANT NUMBER(s) F49620-91-C-0003
9. PERFORMING ORGANIZATION NAME AND ADDRESS RAND 1700 Main Street Santa Monica, CA 90401		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Long Range Planning & Doctrine Div. (AF/XOX) Directorate of Plans, Ofc. Dc/Plans & Operations Hq USAF Washington, DC 20301		12. REPORT DATE December 1989 13. NUMBER OF PAGES 45
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) unclassified 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for Public Release; Distribution Unlimited

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

No Restrictions

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Air Force Personnel
Air Force Planning
Enlisted Personnel
Models
Data Bases

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

See reverse side

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

The Aggregate Dynamic Analysis Model (ADAM) projects active duty Air Force enlisted personnel and their budget costs that will result from user-specified management actions and background economic conditions for 12 years into the future. These projections are for the aggregate force (total across all specialties) by pay grade, years of service, and category of enlistment. The management actions include accessions, reenlistment bonuses, early releases, early reenlistments, promotions, and involuntary separations. The background economic conditions controlled for by the model include civilian unemployment rate, ratio of military wages to civilian wages, and the Consumer Price Index. This user's guide volume describes what the model does, explains how to run the model, and gives example input and output screens. A companion volume, N-3020/2, presents technical documentation for ADAM.

A RAND NOTE

N-3020/1-AF

Aggregate Dynamic Analysis Model (ADAM) for Air Force Enlisted Personnel: User's Guide

William T. Mickelson, C. Peter Rydell

December 1989

Prepared for the
United States Air Force

DTIC COPY INSPECTED 5

A-1

RAND

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED

PREFACE

The work described here is part of the Enlisted Force Management System (EFMS), a joint effort of the Air Force (through the Deputy Chief of Staff for Personnel) and The RAND Corporation. RAND's work falls within the Resource Management Program of Project AIR FORCE. The EFMS is part of a larger body of work in that program concerned with the effective utilization of human resources in the Air Force. For an overview of the entire EFMS, see Carter et al., 1983. That document also presents background information on Air Force personnel policy issues.

The EFMS is a decision support system (DSS) designed to assist managers of the enlisted force in setting and meeting force targets. The system contains computer models that project the force resulting from given management actions, so actions that meet the targets can be found. Some of those models can be used to analyze separate job specialties (disaggregate models) and others to analyze total personnel across all job specialties (aggregate models); some models examine monthly projections (short-term models) and others, annual projections (middle-term models).

The Aggregate Dynamic Analysis Model (ADAM) falls in the aggregate, middle-term category in this summary classification scheme. ADAM projects aggregate Air Force enlisted personnel (by category of enlistment, grade, and years of service) 12 years into the future. The projections are conditional upon economic conditions and management actions specified by the model user. ADAM's comparative advantage with respect to other EFMS models is rapid comparison of many alternative plans using summary measures of performance.

The model is presented in two volumes: The first explains what the model does and how to use it, the second documents the model itself.

Volume 1, *Aggregate Dynamic Analysis Model (ADAM) for Air Force Enlisted Personnel: User's Guide*, N-3020/1-AF, presents the model's user interface (inputs, outputs, and menu screens) and explains how to install and run the model.

Volume 2, *Aggregate Dynamic Analysis Model (ADAM) for Air Force Enlisted Personnel: Technical Documentation*, N-3020/2-AF, describes the theory behind the model, presents action diagrams that document the model's details, and illustrates the model's database.

ADAM is an interactive model written in the "C" computer language. It runs on IBM or IBM-compatible microcomputers with at least 512K of memory. Microcomputer diskettes containing the executable ADAM program and database are available upon request. No additional software is required.

The database supplied with the computer model reflects enlisted personnel inventories and behavior (loss rates, etc.) as of the beginning of fiscal year 1987 (October 1986). The data were assembled from the EFMS data files and other published sources. It is for illustrative purposes and for exploratory policy analyses.

The model itself contains default values of management actions and assumptions about background economic conditions. Menu screens in the model show the user how to revise those default inputs to construct alternative plans and scenarios.

SUMMARY

The Aggregate Dynamic Analysis Model (ADAM) enables users to make projections of the Air Force's total active duty enlisted force (by category of enlistment, grade, and year of service) that will result from user-specified management actions and background economic conditions for 12 years into the future.

The management actions that can be varied include:

- Accessions
- Reenlistment bonuses
- Early releases
- Involuntary separations
- Promotions to the top five grades.

The background economic conditions controlled for by the model include:

- Civilian unemployment rate
- Ratio of military wages to civilian wages
- Consumer Price Index (CPI).

ADAM can be operated in one of two modes: a "what-if" (descriptive) mode, and a "goal seeking" (prescriptive) mode. In the descriptive mode, users choose an entire set of management actions and the model projects the consequent enlisted force. In the prescriptive mode, users choose all management actions except accessions and promotions to the top five grades. The model then determines accessions to achieve user-specified end-of-year force levels (known as "end strengths") and promotions to achieve user-specified end-of-year grade levels (known as "grade strengths").

The two modes are designed to be used iteratively. For example, if an initial what-if run shows that end strength goals are not achieved, then users can do a goal seeking run to find accessions that would achieve the end strength goals. However, the required accessions plan may be unacceptable (for example, it may exhibit too much variation from year to year). In that case, users can return to the what-if mode and

choose a different set of management actions that include smoother required accessions. Finally, a new goal seeking run can fine-tune the accessions plan to hit the end strength targets.

Because ADAM has a very fast runtime (12 seconds for a 12 year projection on a COMPAQ 286 with math coprocessor), such an iterative approach to finding an acceptable overall plan is simple and fast. ADAM therefore exemplifies one of the basic principles of decision support systems. The model does what computers do better than people: testing plans (ADAM's what-if mode) and refining plans (ADAM's goal seeking mode). This leaves enlisted force managers with the time and energy to do what people do better than computers: designing alternative plans and evaluating them.

ACKNOWLEDGMENTS

Three sources of support made this model possible: Project AIR FORCE, through the Enlisted Force Management Project (EFMP) and the Alternative Work Force Structures Project, and professional development funds from the System Sciences Department. From this joint support the authors were able to develop the model's theory and specifications and implement both the model's calculations and user interface in the "C" programming language. Thanks for this support go to project leaders Warren Walker and Craig Moore, and to department head Gene Fisher.

Everyone who worked on the joint Air Force/RAND team for the EFMP in a sense contributed to this model, because this model draws on much of the theory and data developed by the project. However, Air Force team members who deserve particular mention include Major Joseph Cafarella, who worked on the original spreadsheet prototype for ADAM, and Captain Kevin Lawson, who provided the input data for ADAM. RAND team members who deserve special mention include Grace Carter and Michael Murray, who led the team that performed the econometric analyses underlying the model's behavioral equations.

CONTENTS

PREFACE iii

SUMMARY v

ACKNOWLEDGMENTS vii

FIGURES xi

GLOSSARY xiii

Section

I. INTRODUCTION 1
- Purpose 1
- Model Structure 4
- Overview 5

II. GETTING STARTED 6
- Disk Backup 6
- Installation 6
- Operating the Model 7
- Sub-Directory Description 8

III. ADAM MENUS 10
- Main Menu 11
- Annual Inventory Projection 11
- Computer-Aided Design of Management Actions Menu 14
- Plan Comparison 15

IV. INPUT AND OUTPUT SCREENS 17
- Entering a New Plan 17
- Annual Inventory Projection 18
- Computer-Aided Design of Management Actions 30
- Plan Comparison 35

Appendix: SAMPLE REPORT OF MANAGEMENT ACTIONS AND RESULTS 37

REFERENCES 45

GLOSSARY

ADAM	Aggregate Dynamic Analysis Model
ALEC	Aggregate Lifecycle Effectiveness and Cost Model
BAQ	Basic Allowance for Quarters
BMT	Basic Military Training
BTZ	Below the Zone
CATENL	Category of Enlistment
CPI	Consumer Price Index
DOS	Date of Separation
EFMP	Enlisted Force Management Project
EFMS	Enlisted Force Management System
ETS	Expiration of Term of Service
EYOS	End Year of Service
FY	Fiscal Year
IPM	Inventory Projection Model
MOS	Month of Service
MPA	Military Personnel Account
MTA	Middle-Term Aggregate Model
NPS	Non-Prior Service
PCS	Permanent Change of Station
PS	Prior Service
SAM	Short-Term Aggregate Model
VHA	Variable Housing Allowance
YETS	Years to Expiration of Term of Service
YOS	Years of Service

FIGURES

1. Modular structure of ADAM 4
2. Menu hierarchy for ADAM 10
3. Main menu 11
4. Enter management actions menu 12
5. View inventory projection results/program options menu 13
6. Computer-aided design of management actions menu 14
7. Plan comparison options menu 16
8. Input screen for assumptions about economic trends 19
9. Input screen for accessions 20
10. Input screen for zone A bonuses 21
11. Input screen for zone B bonuses 21
12. Input screen for zone C bonuses 22
13. Input screen for early outs and rollup losses 23
14. Input screen for involuntary separations and Palace Chase losses 23
15. Input screen for forced early reenlistments 24
16. Input screen for promotions to top 5 grades 25
17. Output screen for ending inventory by category of enlistment 26
18. Output screen for ending inventory by years of service 26
19. Output screen for ending inventory by grade 27
20. Output screen for average YOS entering each grade 27
21. Output screen for average YOS in each grade 28
22. Output screen for annual ETS retention rates 28
23. Output screen for gains by type 29
24. Output screen for losses by type 29
25. Output screen for policy-free ETS losses 30
26. Output screen for reenlistments 31
27. Output screen for forced early reenlistments out 31
28. Output screen for budget costs 32
29. Input screen for Computer-Aided Design Module 33
30. Output screen for Computer-Aided Design Module: Difference between goal and performance of plan 33
31. Output screen for Computer-Aided Design Module: Total promotions and NPS accessions 34
32. Output screen for Computer-Aided Design Module: Additional promotions and NPS accessions 34
33. Output screen for Plan Comparison Module 36

I. INTRODUCTION

PURPOSE

The Aggregate Dynamic Analysis Model (ADAM) is part of the Air Force's Enlisted Force Management System (EFMS). It is a dynamic policy analysis tool intended for use by Air Force enlisted personnel planners and programmers. ADAM is an inventory projection model that projects aggregate Air Force enlisted personnel (total active duty enlisted force category of enlistment by grade and years of service across all specialties) by fiscal year for 12 years into the future. The projections depend upon user-specified management actions as well as projections of civilian unemployment rates and ratios of military to civilian wages. This model allows enlisted force planners and programmers to analyze the future dynamic implications of alternative management actions and projected economic scenarios on force size, grade composition, and year of service composition in an interactive, fast turnaround, "what-if" setting.

ADAM has been designed for rapid comparison of many alternative plans using summary measures of performance. In the terminology of policy analysis, this means that ADAM is a *screening* model, which is most useful for quickly screening out unpromising plans, rather than an *impact assessment* model, which is most useful for careful examination of the most promising plans.

Because ADAM has a fast runtime, it can be used repeatedly to assist personnel managers in homing in on good plans. ADAM exemplifies one of the basic principles of a good decision support system: to divide the decisionmaking tasks so that the computer does what it does best (testing and refining plans) and people do what they do best (designing and evaluating plans).

Economic Condition Inputs

ADAM's projections are conditional upon user-specified projections of three economic conditions for each fiscal year:

- Civilian unemployment rate
- Ratio of military wages to civilian wages
- Consumer Price Index (CPI).

ADAM uses the EFMS's middle-term aggregate loss models (Carter et al., 1987) to predict airmen reenlistment and loss behavior. According to these models, the higher civilian unemployment and the higher the ratio of military wages to civilian wages, the greater the propensity of enlisted personnel to remain in the enlisted force at the end of each term of enlistment. The CPI is used to adjust projected constant budget dollars into nominal budget dollars.

Management Action Inputs

ADAM accepts user-specified values for the following management actions, for each fiscal year of the projection:

- Accessions
 - — non-prior service for a four-year term of enlistment
 - — non-prior service for a six-year term of enlistment
 - — prior service
- Percent of force receiving reenlistment bonuses
 - — by type of bonus
 - — by size of bonus
- Early releases
 - — to Reserves (the "Palace Chase" program)[1]
 - — of next fiscal year's losses ("Early Outs")
 - — of this fiscal year's losses ("Rollups")
- Forced early reenlistments
- Involuntary separations
- Promotions to the top five grades (E-5 through E-9)

Accessions control gains to the enlisted force. Reenlistment bonuses, early releases, and involuntary separations control losses from the force. Promotions control the grade distribution of the force.

[1]The Palace Chase program allows active duty enlisted personnel to fulfill their Air Force commitment in the Air Force Reserves.

Goal Inputs

Goals for the aggregate enlisted force are customarily summarized by end strength (the total number of enlisted personnel in the Air Force at the end of each fiscal year) and grade strength ceilings (the total number of enlisted personnel in the Air Force in each grade at the end of each fiscal year). A component of ADAM, called the computer-aided design module, accepts user choices of these goals for each fiscal year and determines the annual accessions and promotions required to achieve these goals.

The model's suggested plan for accessions and promotions is conditional upon the user choices of all other management actions listed above and, of course, upon the user-specified goals. Iterative use of ADAM's "what-if" and goal seeking modes enables users to construct a plan of management actions that achieves the goals and also satisfies such judgmental criteria as smooth flow of accessions and promotions.

Inventory and Inventory Change

To enable users to compare alternative management actions, the ADAM model estimates and reports the following consequences of the management actions by fiscal year.

- Enlisted force inventory
 - — by grade
 - — by category of enlistment
 - — by years of service
- Average years of service
 - — of persons entering each grade
 - — of persons in each grade
- Annual retention rates
- Gains (by type of gain)
- Losses (by type of loss)
- Reenlistments (by category of enlistment)
- Costs (by budget category)
 - — in constant dollars
 - — in nominal dollars

MODEL STRUCTURE

Three modules make up ADAM. These modules are listed and described below. The relationship among these modules is shown in Fig. 1.

- Module 1: Annual Inventory Projection
- Module 2: Computer-Aided Design of Management Actions
- Module 3: Comparison of Plans

ADAM has been designed so that each module can be used independently or in conjunction with the others.

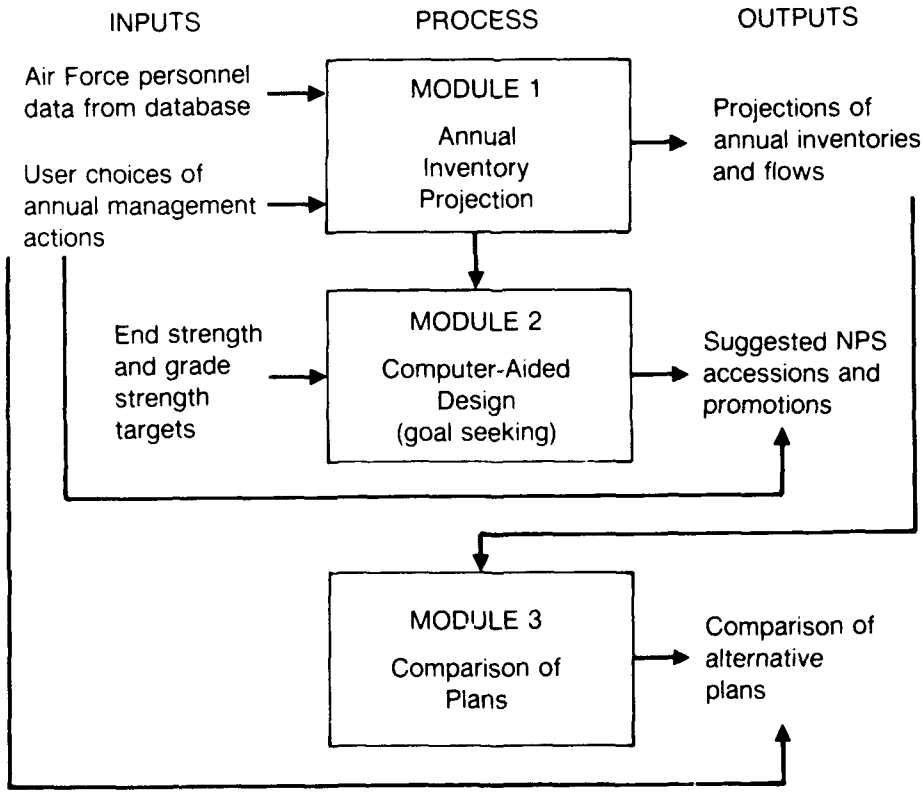


Fig. 1—Modular structure of ADAM

Module 1: Annual Inventory Projection

This module contains the machinery that projects Air Force enlisted personnel year by year for 12 years into the future. It responds to user-chosen management actions and economic conditions and projects the annual inventories, flows, and promotion and retention rates that result from those actions.

Module 2: Computer-Aided Design of Management Actions

This module computes accession and promotion actions, conditional on the user-specified choices of all other management actions and the assumed economic conditions, that will enable the inventory to achieve end strength and grade strength targets for 12 fiscal years into the future. Users have the option of sending the results of this module automatically to the management action space of module 1 (see Sec. III).

Module 3: Plan Comparison

After two or more plans have been constructed and their results saved, this module can be run to systematically compare the differences in force structure of the alternative plans. Comparisons can be made by grade, years of service, and total active duty enlisted force. These comparisons guide users when they construct revised management action plans.

OVERVIEW

This Note gives complete operating instructions for ADAM, describes the structure of the model, and presents the input and output screens with sample results. Section II describes the computer hardware requirements, installation procedure, and how to begin and end the program. Section III describes the structure of ADAM's menu system, defines the function of the menus, and outlines how to make choices. Section IV explains how to enter a plan through input screens and how to view the results through the output screens.

II. GETTING STARTED

ADAM is written in the "C" programming language. A software product from Oakland Group, Inc., called C-Scape/Look and Feel, was used to design and develop the user interface (menus, and input and output screens). See Cooke, DeSantis, et al., 1987. ADAM is intended for use on IBM or IBM-compatible microcomputers with two disk drives or one disk drive with a hard disk, and 512K of RAM memory. ADAM will utilize a math coprocessor if one is installed in the computer.

DISK BACKUP

ADAM is sent on two disks. The first disk, labeled ADAM PROGRAM, contains the executable program, ADAM.EXE. The second disk, labeled ADAM DATA, contains the following files in the DATA sub-directory: ATTRRATE, BEGINV, COSTS, EARLYOUT, ETSRATE, FER, LOSSCOEF, OTHER, PALCHASE, PROMRATE, RETIRE, REUPCOEF, REUPRATE, and ROLLUP. These files are ASCII readable and contain Air Force enlisted personnel data.

The first thing to do with the ADAM disks is to make working copies. Keep the original disks for use as backups.

INSTALLATION

ADAM reads its data from, and stores its results in, sub-directories, which must be created prior to running the model.

Users With Hard Disk

Before one can run ADAM, it is necessary to create the appropriate directories and sub-directories on the hard disk. The sequence of DOS commands required to make these sub-directories and to install the ADAM program and data are listed as steps 1–12 below. These commands assume the current drive is the ROOT directory of the C drive.

1. Place the ADAM PROGRAM disk in drive A
2. Place the ADAM DATA disk in drive B
3. mkdir ADAM

4. cd ADAM
5. copy a:ADAM.EXE
6. mkdir COMPARE
7. mkdir DATA
8. mkdir GOALS
9. mkdir PLANS
10. mkdir REPORT
11. cd DATA
12. copy b:\ADAM\DATA*.*

After the execution of these 12 commands, the executable program ADAM.EXE will be in the ADAM directory and the data files will be in the DATA sub-directory of the ADAM directory.

Users with Two Disk Drives

Before the ADAM model can be run, the appropriate directories and sub-directories must be included on the working version of the ADAM DATA disk. The ADAM DATA disk should include one directory named *ADAM. This directory should* have five sub-directories named: COMPARE, DATA, GOALS, PLANS, and REPORT. If these directories are not on the ADAM DATA disk, place the ADAM DATA disk in drive B and follow steps 6 through 10 above to create these sub-directories. The DATA sub-directory should contain the following files: ATTRRATE, BEGINV, COSTS EARLYOUT, ETSRATE, FER, LOSSCOEF, OTHER, PALCHASE, PROMRATE, RETIRE REUPCOEF, REUPRATE, and ROLLUP.

OPERATING THE MODEL

Users with Hard Disk

To operate ADAM using a hard disk, change the directory to the ADAM directory on the C drive and type ADAM. Once the program and data have been loaded into the computer, a title screen will appear. At this time, press the ENTER key to view ADAM's main menu.

It is possible to leave the program only from the main menu. To exit the program choose the EXIT ADAM option from the main menu (or hit the escape key from the main menu) and answer 'Y' or 'y' (for yes) to the question "Do you wish to exit the program?"

Users with Two Disk Drives

To operate ADAM using a two-disk drive computer:

1. Place the ADAM PROGRAM disk in drive A
2. Place the ADAM DATA disk in drive B
3. Set the default drive to B (type b: at the prompt)
4. Type cd ADAM
5. Type a:ADAM

Once the program and data have been loaded into the computer, a title screen will appear. At this time, press the ENTER key to view ADAM's main menu.

To leave the program, follow the steps described above.

SUB-DIRECTORY DESCRIPTION

The ADAM directory contains the model itself and five sub-directories used by the model as sources of data or locations to put results. Those sub-directories are: COMPARE, DATA, GOALS, PLANS, and REPORT. The purpose of these directories is described below.

COMPARE Sub-directory

The COMPARE sub-directory retains files containing force structure results. These files are used in the Comparison of Plans Module. At least two files must be saved in this directory to make a plan comparison. New files are added whenever annual inventory projection results are saved (see Sec. III).

DATA Sub-directory

The DATA sub-directory contains all of the enlisted personnel data required to run ADAM. For a description of the required data, see Mickelson and Rydell, 1989. This sub-directory contains the following files:

- ATTRRATE (Attrition Rates)
- BEGINV (Beginning Inventory)
- COSTS (Personnel Cost Factors)
- EARLYOUT (Early Out Losses and Rates)
- ETSRATE (Expiration of Term of Service Rates)

- FER (Forced Early Reenlistment Losses and Rates)
- LOSSCOEF (ETS Loss Coefficients)
- OTHER (Miscellaneous Data)
- PALCHASE (Palace Chase Losses and Rates)
- PROMRATE (Trial Promotion Rates)
- RETIRE (Retirement Rates)
- REUPCOEF (Reenlistment Coefficients)
- REUPRATE (Reenlistment Rates)
- ROLLUP (Rollup Losses and Rates)

These data should be updated once each fiscal year. Contact the Washington Area Personnel Systems Division (AFMPC/DPMDW) at Bolling AFB for updated data.

GOALS Sub-directory

The GOALS sub-directory contains files of end strength and grade strength targets. These files are used in the Computer-Aided Design of Management Actions (goal seeking) module of ADAM. New user-created files may be added to this sub-directory from the Computer-Aided Design of Management Actions menu (see Sec. *III*).

PLANS Sub-directory

The PLANS sub-directory contains files of management action plans. These files can be used in the Inventory Projection Module of ADAM to enter previously saved management action plans. This directory contains at least the file, called BASECASE, corresponding to the initial default management action settings. New files are added whenever annual inventory projection results are saved (see Sec. II).

REPORT Sub-directory

The REPORT sub-directory contains the primary reports from runs of the Annual Inventory Projection module of ADAM. The files in this directory contain a listing of all input management actions, as well as the projected results of that plan. New files are added whenever annual inventory projection results are saved (see Sec. III). The appendix gives an example of a report from ADAM.

III. ADAM MENUS

The user interface of ADAM consists of a system of menus, along with management action input screens and output display screens. This section examines the menus used in the ADAM program. Section IV documents the input and output screens.

The menu system offers an easy to understand, easy to use interface with the computer that allows a great amount of flexibility in the use of ADAM as a policy analysis tool. Figure 2 shows the menu hierarchy.

To select options from any menu, use the UP and DOWN arrow keys to highlight the desired option and press ENTER. In addition to the arrow keys, the HOME key highlights the uppermost menu option, and the END key highlights the lowermost menu option. It is also possible to select an option by typing that option's first letter (resulting in that option being highlighted) and pressing ENTER.

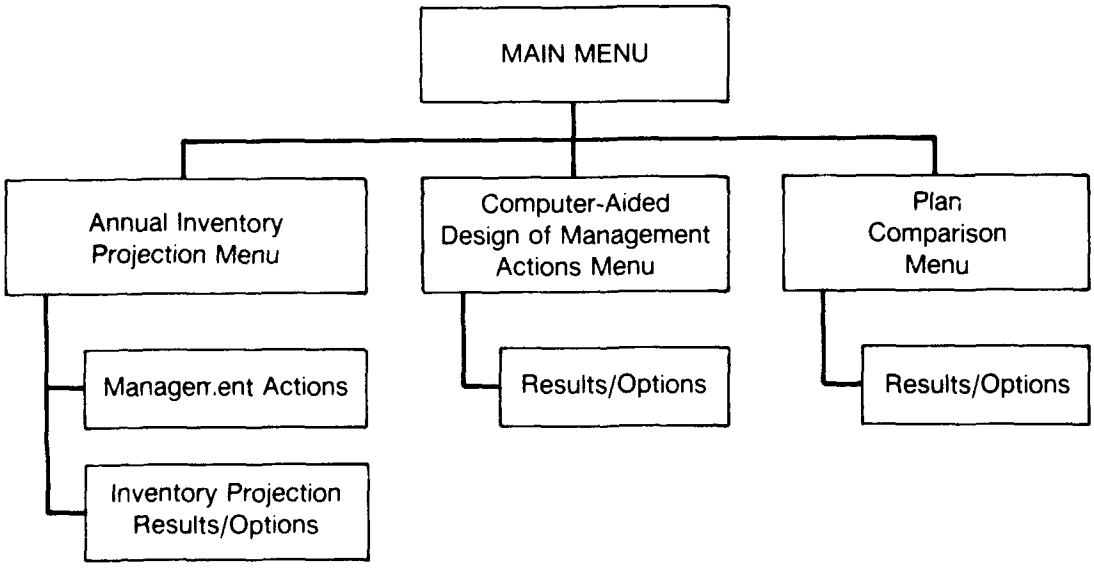


Fig. 2—Menu hierarchy for ADAM

MAIN MENU

Figure 3 shows the Main Menu. It is the first menu to appear after the title screen. At this point the user selects one of following options: (1) Annual Inventory Projection, (2) Computer-Aided Design of Management Actions, (3) Plan Comparison, or (4) EXIT ADAM. These options correspond to the modules, or functions, of ADAM. The remainder of this section describes the menus associated with each of these options.

If the EXIT option is chosen, or the ESC (escape) key is pressed, the computer asks the question, "Do you wish to exit the program? (Y/N)." A 'Y' or 'y' response exits the program. An 'N' or 'n' response returns to the Main Menu. The Main Menu is the only location from which it is pos ble to leave the ADAM program.

ANNUAL INVENTORY PROJECTION

Upon selection of the Annual Inventory Projection option, ADAM gives a listing of files located in the PLANS sub-directory. These files contain management action plans saved from previous runs of the Annual Inventory Projection Module. ADAM prompts the user to enter the name of a previously saved plan to be used in the analysis. If there are no files saved in the PLANS sub-directory, or if the previously saved plans are not of interest, the user may type 'x' at the prompt for a default set of management actions.

Figure 4 shows the menu for entering management actions and assumptions. The user may make changes to those entries by selecting from the following options: (1) Future Economic Trend, (2) Accessions, (3) Bonuses, (4) Early Outs/Rollups/Early

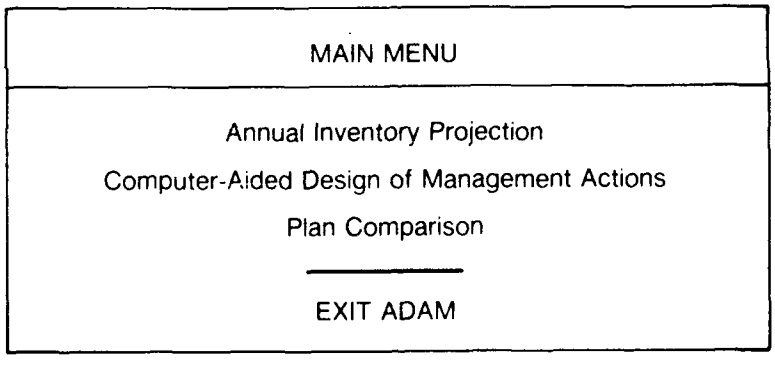


Fig. 3—Main menu

Reenlistments, (5) Involuntary Separations and Palace Chase Losses, and (6) Promotions. Selecting a particular option allows the user direct access to all of the management action input screens associated with that option (see Sec. IV for details on the management action input screens).

After the plan has been entered, the user must select the CALCULATE INVENTORY PROJECTION option to calculate the implications of that management action plan. It is possible to return to the Main Menu without performing the inventory calculations by pressing the ESC key.

Upon completion of the inventory projection calculations, ADAM displays the View Inventory Projection Results/Program Options menu (Fig. 5). This menu allows the user to (1) view the inventory projection results and (2) perform other program functions.

By choosing from among the options associated with the View Inventory Projection Results, the user can view the output screen(s) from the following types of results: (1) Ending Inventory, (2) Average Years of Service, (3) Retention Rates, (4) Gains/Losses/Reenlistments, and (5) Budget Costs. Once the user has viewed all output screens associated with a particular option, ADAM returns to this menu (Fig. 5). To return to the menu (Fig. 5) from any of the output screens, simply press the ESC key.

In addition to the inventory projection results, the user may select other program options, including (1) Save Results, (2) Plan Revision, (3) New Plan from Disk, and (4) Return to the Main Menu.

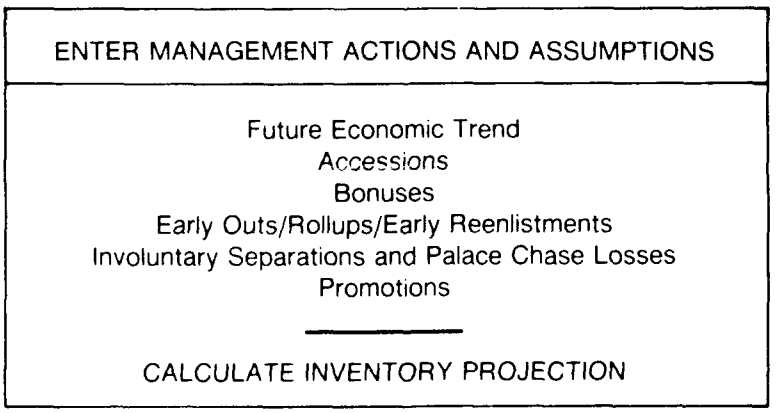


Fig. 4—Enter management actions menu

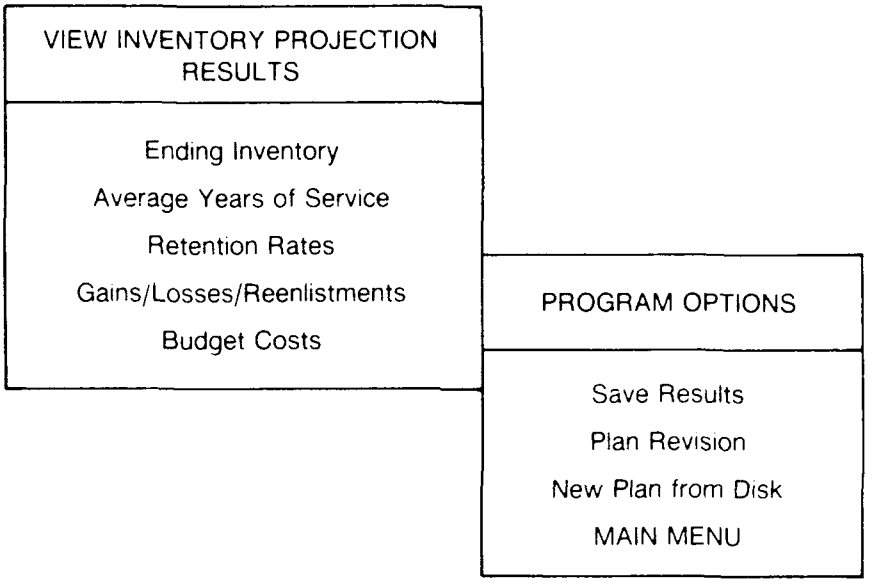


Fig. 5—View inventory projection results/program options menu

The Save Results option saves the inventory projection results for later use. ADAM prompts the user for a filename, then generates three files. The first file is a report consisting of all management action inputs and resulting outputs. This information is saved under the user-given filename in the REPORTS sub-directory. The second file is saved for plan comparison purposes. It is placed in the COMPARE sub-directory under the same user-specified filename and contains only force structure results. The third file consists of management actions. It is placed in the PLANS sub-directory under the same user-specified name and is saved so that that plan can be used again in future analyses.

The Plan Revision option takes the user back to the Enter Management Actions menu to revise and run a new management action plan. The Enter New Plan from Disk option allows the user to read in a different, previously saved management action plan from disk. Finally, the MAIN MENU option returns the user to the Main Menu. It is possible to return to the Main Menu by pressing the ESC key.

COMPUTER-AIDED DESIGN OF MANAGEMENT ACTIONS MENU

Upon selection of the Computer-Aided Design of Management Actions option, ADAM gives a listing of the files located in the GOALS sub-directory. These files contain previously saved end strength and grade strength goals or targets. ADAM then prompts the user to enter the filename of the goals to be used in the analysis. If there are no files in the GOALS sub-directory, or if the previously saved goals are not of interest, the user may type 'x' at the prompt for a default set of end strength and grade strength goals.

At this point, ADAM presents a screen that displays the end strength and grade strength goals. The user is able to specify a new set of goals by making changes to these values (see Sec. IV). Leaving this input screen directs the computer to calculate the number of accessions and promotions needed to attain the specified end strength and grade strength goals.

Figure 6 shows the Computer-Aided Design of Management Actions menu. The user may select from the following options: (1) VIEW Results, (2) SAVE goals to file, (3) Revise grade and end strength goals, (4) New goals from disk, (5) Send designed accessions and promotions to Inventory Projection Module, and (6) MAIN MENU.

Selecting the VIEW Results option, the user can view the output screens of the Computer-Aided Design of Management Actions module. Once the user has viewed all of these output screens, ADAM returns to this menu (Fig. 6). To return to the menu (Fig. 6) from any of the output screens, simply press the ESC key.

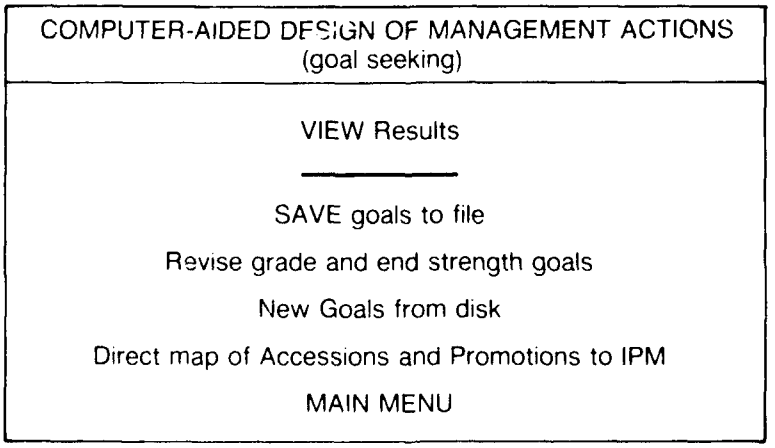


Fig. 6—Computer-aided design of management actions menu

The Save goals option saves the end strength and grade strength goals for later use. ADAM prompts the user for a filename and saves the end strength and grade strength goals in the GOALS sub-directory. The Revise grade and end strength goals option takes the user back to the Computer-aided design input screen for the purpose of entering (revising) new targets. The New goals from disk option allows the user to read in a file of previously saved end strength and grade strength goals.

The Direct map of accessions and promotions to Inventory Projection Model (IPM) option is the link between the goal seeking module and the inventory projection module. The goal seeking calculations have determined the accessions and promotions needed to hit the given end strength and grade strength goals. This option copies these accessions and promotions into the management action space of the Annual Inventory Projection Module and returns the user to the Main Menu.

The MAIN MENU option returns the user to the Main Menu. It is also possible to return to the Main Menu by pressing the ESC key.

PLAN COMPARISON

Upon selection of the Plan Comparison option, ADAM gives a listing of the files located in the COMPARE sub-directory. These files contain force structure results from previously saved runs of the Annual Inventory Projection module. ADAM prompts the user to enter two file names for comparison. One file is referred to as the reference plan, the other file is the test plan. If there are not at least two files in the COMPARE sub-directory, or if the previously saved files are not of interest, the user may type 'QUIT' at either prompt to return to the Main Menu.

Figure 7 shows the Plan Comparison Options menu. The user may select from the following options: (1) Grade Comparison, (2) Year of Service Comparison, (3) Total Enlisted Force Comparison, (4) Specify new plans, and (5) MAIN MENU.

The first three options, Grade Comparison, Year of Service Comparison, and Total Enlisted Force Comparison, are force structure comparisons (see Sec IV. for details on the output displayed). The Specify new plans option allows the user to specify different plans for comparison. As before, the MAIN MENU option returns the user to the Main Menu. It is possible to return to the Main Menu by pressing the ESC key.

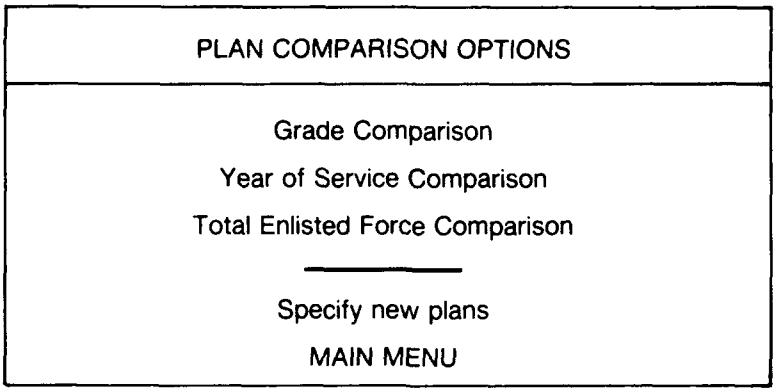


Fig. 7—Plan comparison options menu

IV. INPUT AND OUTPUT SCREENS

ENTERING A NEW PLAN

Each of the input and output screens contain two kinds of information. The first identifies the nature of the input or output (these are the title and column headings). The second shows the values of the management action inputs or the projected results of those actions.

The input screens provide options for user interaction that are not available on the output screens. All input screens consist of locations, called fields, where the values associated with a management action are displayed. Each field is directly accessible by the user, and the values displayed can be easily changed. A blinking cursor within a field (which we call the field "highlight") indicates the location where the user may enter new values.

To enter the values defining a new plan, one simply moves the field highlight to the desired field(s). Move the cursor to the location within the field where the change is desired and enter the new value(s). The keys that handle movement between fields, movement within fields, and other function keys are described below.

Movement Between Fields

Six different key strokes will move the field highlight among fields. These keys allow the user easy access to, and movement among, all input fields on an input screen. The key strokes and their functions are given below.

TAB	Moves field highlight one field to the right.
SHIFT TAB	Moves field highlight one field to the left.
UP ARROW	Moves field highlight up one field.
DOWN ARROW	Moves field highlight down one field.
HOME	Moves field highlight to the field in the upper left corner of the screen.
END	Moves field highlight to the bottommost field, which confirms entry of the plan.

Movement Within a Field

Two key strokes allow movement within a field. These permit the user to move to a particular location within a field at which the user would like to change the value. The key strokes and their functions are given below.

RIGHT ARROW	Moves cursor within a field one space to the right. If the cursor is located in the rightmost position in the field, the field highlight is moved one field to the right.
LEFT ARROW	Moves cursor within a field one space to the left. If the cursor is located in the leftmost position in the field, the field highlight is moved one field to the left.

Other Keys

Three other keys enhance the user interface. These keys are described below.

INSERT	Allows values to be inserted at the cursor. When the insert is activated, the cursor appears as a block.
DELETE	Deletes the value at the cursor.
ESCAPE	Allows escape from the screen and returns to the most recent menu.

ANNUAL INVENTORY PROJECTION

These are the main user interface screens for ADAM. They accept user-specified inputs of economic conditions and management actions, and they report estimates of inventory and inventory change.

When an option from the ENTER MANAGEMENT ACTIONS menu is selected, the input screen(s) for that option are displayed. The input screens show the assumed economic conditions and management actions that were read in from disk when entering the Annual Inventory Projection module. The output screens produced when the CALCULATE INVENTORY PROJECTION option is chosen contain the results of running the Annual Inventory Projection module of ADAM using the specified management actions. The basecase (default) values shown on the management action input screens in Figs. 8–16 are the ones contained on the ADAM DATA disk in the file BASECASE.

Management Action and Assumptions Input Screens

The user inputs are of two kinds: assumptions about economic trends (Fig. 8), and the annual management actions that define the plan to be tested (Figs. 9 through 16).

Using the screen in Fig. 8, the user can input information about three economic trends:

- The predicted annual average unemployment rate for 20–24 year olds (percentage)
- The ratio of military basic pay and comparable civilian wages
- The Consumer Price Index.

The unemployment rate and ratio of military to civilian wages have a direct effect on loss and enlistment behavior. The CPI is used to adjust constant dollars into nominal dollars. For an explanation of these economic variables see Walker and McGary, 1989.

Using the screen shown in Fig. 10, the user can specify Non-Prior (NPS) accessions, the percent of accessions with a four-year term of enlistment, and Prior Service (PS) accessions.

ASSUMPTIONS ABOUT ECONOMIC TRENDS

Projection Year	Civilian (20-24) Unemployment Rate (%)	Ratio of Military to Civilian Pay	Consumer Price Index
1988	9.50	0.90	350.0
1989	9.50	0.90	350.0
1990	9.50	0.90	350.0
1991	9.50	0.90	350.0
1992	9.50	0.90	350.0
1993	9.50	0.90	350.0
1994	9.50	0.90	350.0
1995	9.50	0.90	350.0
1996	9.50	0.90	350.0
1997	9.50	0.90	350.0
1998	9.50	0.90	350.0
1999	9.50	0.90	350.0

Fig. 8—Input screen for assumptions about economic trends

ACCESSIONS

Projection Year	TOTAL NPS Accessions	Percent 4-Year TOE	PS Accessions
1988	59000	85.0	2000
1989	59000	85.0	2000
1990	59000	85.0	2000
1991	59000	85.0	2000
1992	59000	85.0	2000
1993	59000	85.0	2000
1994	59000	85.0	2000
1995	59000	85.0	2000
1996	59000	85.0	2000
1997	59000	85.0	2000
1998	59000	85.0	2000
1999	59000	85.0	2000

Fig. 9—Input screen for accessions

Figures 10 through 12 are the input screens for providing aggregate summaries of reenlistment bonuses for zones A, B, and C, respectively. The inputs are the percentage of the force in the appropriate year-of-service grouping (e.g. YOS 3–6 for zone A bonuses) who will receive bonuses. These management actions are normally planned at the disaggregate level (that is, by specific occupations). However, these screens provide the opportunity for aggregate planners to explore alternative total bonus levels that can be used as aggregate guidelines for disaggregate planning.

Figures 13 and 14 are the input screens for specifying the numbers of losses caused by early release programs and involuntary separations. Early release programs allow people who plan to leave the enlisted force to leave before the end of their enlistment periods. Involuntary separations force airmen to leave the enlisted force when they would have reenlisted.

The three early release programs are:

- Rollup: early release of personnel in the same fiscal year in which their enlistment period ends. This program is used to reduce military personnel account costs in the year in which the early release occurs.

PERCENT OF FORCE RECEIVING ZONE A (YOS 3 TO 6) BONUSES

Projection Year	Zone A Bonus Multiple						
	0.5	1.0	2.0	3.0	4.0	5.0	6.0
1988	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1989	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1990	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1991	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1992	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1993	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1994	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1995	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1996	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1997	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1998	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1999	12.50	27.70	8.10	1.30	0.00	0.00	0.00

Fig. 10—Input screen for zone A bonuses

PERCENT OF FORCE RECEIVING ZONE B (YOS 7 TO 10) BONUSES

Projection Year	Zone B Bonus Multiple						
	0.5	1.0	2.0	3.0	4.0	5.0	6.0
1988	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1989	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1990	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1991	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1992	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1993	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1994	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1995	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1996	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1997	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1998	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1999	3.60	24.10	8.50	0.00	0.00	0.00	0.00

Fig. 11—Input screen for zone B bonuses

- Early Out: early release of personnel in the fiscal year before the fiscal year in which their enlistment period ends. This program is used to reduce end strength in the year in which the early release occurs.
- Palace Chase: early release of personnel from the active force as many as four fiscal years before the fiscal year in which their enlistment period ends. In this program, the airmen remain in the Air Force but are transferred to the Reserves.

Rollups do not affect the end-of-year inventory (because rollups are early releases during a fiscal year of losses that would have occurred anyway before the end of the fiscal year). However, rollup actions must be specified in annual analyses because they affect the cost of the enlisted force during a fiscal year.

Figure 15 allows the user to enter the forced early reenlistment policy by specifying the number of forced early reenlistments in each fiscal year. Users enter this number by category of enlistment, and by whether the reenlistment would otherwise have occurred in the same fiscal year or in the next fiscal year. For a discussion of the forced early reenlistment program see Mickelson and Rydell, 1989.

PERCENT OF FORCE RECEIVING ZONE C (YOS 11 TO 14) BONUSES

	Zone C Bonus Multiple						
Projection Year	0.5	1.0	2.0	3.0	4.0	5.0	6.0
1988	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1989	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1990	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1991	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1992	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1993	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1994	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1995	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Fig. 12—Input screen for zone C bonuses

EARLY-OUT AND ROLLUP LOSSES

Projection Year	Early Outs		Rollups	
	First Term	Second Term	First Term	Second Term
1988	0	0	0	0
1989	0	0	0	0
1990	0	0	0	0
1991	0	0	0	0
1992	0	0	0	0
1993	0	0	0	0
1994	0	0	0	0
1995	0	0	0	0
1996	0	0	0	0
1997	0	0	0	0
1998	0	0	0	0
1999	0	0	0	0

Fig. 13—Input screen for early outs and rollup losses

INVOLUNTARY SEPARATIONS AND PALACE CHASE LOSSES

Projection Year	Involuntary Separations		Palace Chase Losses
	First Term	Second Term	
1988	0	0	2582
1989	0	0	2582
1990	0	0	2582
1991	0	0	2582
1992	0	0	2582
1993	0	0	2582
1994	0	0	2582
1995	0	0	2582
1996	0	0	2582
1997	0	0	2582
1998	0	0	2582
1999	0	0	2582

Fig. 14—Input screen for involuntary separations and Palace Chase losses

FORCED EARLY REENLISTMENTS

Projection Year	From Same FY			From Next FY		
	First Term	Second Term	Career Terms	First Term	Second Term	Career Terms
1988	0	0	0	0	0	0
1989	0	0	0	0	0	0
1990	0	0	0	0	0	0
1991	0	0	0	0	0	0
1992	0	0	0	0	0	0
1993	0	0	0	0	0	0
1994	0	0	0	0	0	0
1995	0	0	0	0	0	0
1996	0	0	0	0	0	0
1997	0	0	0	0	0	0
1998	0	0	0	0	0	0
1999	.	0	0	0	0	0

Fig. 15—Input screen for forced early reenlistments

Finally, numbers of promotions to grades E-5 through E-9 are explicit management actions (see Fig. 16). Promotions to grades E-1 through E-4 are estimated by historical behavior.

Inventory Projection Output Screens

ADAM produces a wide collection of summary output screens, including ending inventory; average years of service; gains, losses, and reenlistments; retention rates; and budget costs.

Figures 17 through 19 present the summary output screens for ending inventory by category of enlistment, years of service, and grade respectively. Each of these screens also contains a high-level measure that summarizes the view of force structure that can be used to quickly evaluate the performance of a plan:

PROMOTIONS TO GRADE

Projection Year	Grade E-5	E-6	E-7	E-8	E-9
1988	19900	10600	7500	2500	1000
1989	19900	10600	7500	2500	1000
1990	19900	10600	7500	2500	1000
1991	19900	10600	7500	2500	1000
1992	19900	10600	7500	2500	1000
1993	19900	10600	7500	2500	1000
1994	19900	10600	7500	2500	1000
1995	19900	10600	7500	2500	1000
1996	19900	10600	7500	2500	1000
1997	19900	10600	7500	2500	1000
1998	19900	10600	7500	2500	1000
1999	19900	10600	7500	2500	1000

Fig. 16—Input screen for promotions to top 5 grades

- Percent of the enlisted force in their second or higher term (Fig. 17)
- Percent of the enlisted force with four or more years of service (Fig. 18)
- Percent of the enlisted force in grade E-5 or higher (Fig. 19)

Figures 20 and 21 show the screens that present the average years of service of persons entering each grade and the average years of service of persons in each grade. Figures 22 shows the screen that presents fiscal year retention rates.

The next three output screens summarize gains and losses by type for each projection year. Figure 23 presents gains. Figure 24 presents losses. The policy-free loss screen (Fig. 25) shows how expiration of term of service (ETS) losses are adjusted to eliminate the effects of the three early release programs.

Figures 26 and 27 summarize reenlistments. Figure 26 shows the output screen for reenlistments by category of enlistment. Figure 27 presents the output screen that translates policy-free reenlistments (the reenlistments that would have occurred in the absence of the forced early reenlistment program) into actual reenlistments. This screen

ENLISTED FORCE BY CATEGORY OF ENLISTMENT

Projection Year	Category of Enlistment: First Term	Second Term	Career Term	Retirement Eligible Term	Total	Percent of Force Second Term or Higher
1988	209910	120668	138121	22806	491505	57.29
1989	200703	120937	143075	23690	488405	58.91
1990	194930	118913	146381	25854	486078	59.90
1991	191031	117349	147665	27322	483367	60.48
1992	189210	123712	146563	25890	485375	61.02
1993	188398	127577	143144	27285	486404	61.27
1994	188375	125737	145064	26969	486145	61.25
1995	188323	122551	146498	27597	484969	61.17
1996	188265	120051	147131	27844	483291	61.05
1997	188218	118546	148037	27300	482101	60.96
1998	188191	117820	148221	26851	481083	60.88
1999	188180	117496	146488	27106	479270	60.74

Fig. 17—Output screen for ending inventory by category of enlistment

ENLISTED FORCE BY YEARS OF SERVICE

Projection Year	Years of Service: 0-3	4-7	8-11	12-15	16-19	20-24	25-29	Total	Percent of Force 4 or more YOS
1988	198040	109215	65659	51354	44431	18318	4488	491505	59.71
1989	185474	112222	69560	50524	46935	18920	4770	488405	62.02
1990	178248	112953	71996	51796	45231	21130	4724	486078	63.33
1991	174715	109519	73324	53303	45184	22665	4657	483367	63.85
1992	174682	105473	73871	56124	49335	21361	4529	485375	64.01
1993	174744	98757	77584	59561	48473	22456	4829	486404	64.07
1994	174787	95220	77699	61805	49665	21946	5023	486145	64.05
1995	174743	93601	74871	63115	51042	21985	5612	484969	63.97
1996	174687	93603	71671	61839	53647	22016	5828	483291	63.85
1997	174648	93606	67212	62495	56840	22045	5255	482101	63.77
1998	174627	93605	64792	62297	58911	21370	5481	481083	63.70
1999	174620	93580	63732	60162	60070	21923	5183	479270	63.57

Fig. 18—Output screen for ending inventory by years of service

ENLISTED FORCE BY GRADE

Projection Year	Grade E1-E3	E-4	E-5	E-6	E-7	E-8	E-9	Total	Percent of Force Grade E-5 or Higher
1988	140116	122856	115157	59751	39052	9759	4814	491505	46.50
1989	132885	125494	116005	60326	38970	9790	4935	488405	47.10
1990	130458	124740	117159	60567	38413	9710	5031	486078	47.50
1991	130316	122050	118074	60638	37644	9564	5081	483367	47.79
1992	130320	121014	121091	61086	37377	9476	5011	485375	48.22
1993	130382	120014	124017	61014	36705	9412	4860	486404	48.52
1994	130382	118919	125704	60919	36101	9352	4768	486145	48.72
1995	130349	117795	126897	60546	35370	9265	4747	484969	48.83
1996	130324	116801	127985	59849	34502	9106	4724	483291	48.87
1997	130307	115968	129147	59211	33827	8946	4695	482101	48.92
1998	130300	115257	130217	58476	33450	8796	4587	481083	48.96
1999	130299	114639	130902	57399	32844	8685	4502	479270	48.89

Fig. 19—Output screen for ending inventory by grade

AVERAGE YEARS OF SERVICE OF PERSONS ENTERING EACH GRADE

Projection Year	Grade E1-E3	E-4	E-5	E-6	E-7	E-8	E-9
1988	0.84	3.21	6.12	12.15	16.65	20.24	23.15
1989	0.83	3.22	6.07	12.20	16.71	20.16	23.18
1990	0.83	3.26	6.11	12.25	16.75	20.18	23.18
1991	0.83	3.28	6.24	12.34	16.78	20.28	23.18
1992	0.83	3.25	6.43	12.49	16.87	20.37	23.24
1993	0.83	3.21	6.59	12.63	16.93	20.48	23.37
1994	0.83	3.21	6.67	12.83	17.02	20.55	23.54
1995	0.83	3.22	6.69	13.01	17.10	20.61	23.67
1996	0.83	3.22	6.69	13.20	17.16	20.62	23.73
1997	0.83	3.22	6.66	13.40	17.25	20.63	23.76
1998	0.83	3.23	6.64	13.59	17.36	20.68	23.72
1999	0.83	3.23	6.62	13.74	17.47	20.68	23.69

Fig. 20—Output screen for average YOS entering each grade

AVERAGE YEARS OF SERVICE OF PERSONS IN EACH GRADE

Projection Year	Grade						
	E1-E3	E-4	E-5	E-6	E-7	E-8	E-9
1988	0.92	3.99	8.61	13.98	18.01	21.03	24.28
1989	0.89	4.09	8.82	14.13	18.14	21.19	24.56
1990	0.87	4.24	9.01	14.26	18.26	21.33	24.83
1991	0.87	4.37	9.21	14.38	18.37	21.47	25.04
1992	0.87	4.45	9.42	14.54	18.48	21.61	25.14
1993	0.87	4.49	9.64	14.67	18.57	21.77	25.15
1994	0.87	4.49	9.86	14.82	18.64	21.90	25.21
1995	0.87	4.47	10.04	14.97	18.71	22.01	25.33
1996	0.87	4.45	10.19	15.11	18.74	22.04	25.47
1997	0.87	4.44	10.33	15.26	18.78	22.05	25.59
1998	0.87	4.42	10.43	15.41	18.86	22.03	25.58
1999	0.87	4.40	10.49	15.53	18.92	22.02	25.57

Fig. 21—Output screen for average YOS in each grade

ANNUAL ETS RETENTION RATES
(Reenlistments as Percent of Policy-Free ETS Losses Plus Reenlistments)

Projection Year	First Term	Second Term	Career Terms	Average
1988	54.43	75.03	98.09	71.08
1989	54.11	75.02	98.21	70.98
1990	54.13	75.47	98.12	71.90
1991	54.32	70.92	98.01	71.60
1992	54.37	72.99	97.90	72.61
1993	54.14	76.05	97.84	73.32
1994	54.34	73.51	97.81	73.18
1995	54.35	73.58	97.77	73.41
1996	54.33	74.06	97.70	73.65
1997	54.30	74.32	97.62	73.69
1998	54.30	74.45	97.56	73.59
1999	54.29	74.47	97.57	73.51

Fig. 22—Output screen for annual ETS retention rates

GAINS BY TYPE

Projection Year	NPS Accessions 4-Year	6-Year	Total	PS Accessions	TOTAL GAINS
1988	50150	8850	59000	2000	61000
1989	50150	8850	59000	2000	61000
1990	50150	8850	59000	2000	61000
1991	50150	8850	59000	2000	61000
1992	50150	8850	59000	2000	61000
1993	50150	8850	59000	2000	61000
1994	50150	8850	59000	2000	61000
1995	50150	8850	59000	2000	61000
1996	50150	8850	59000	2000	61000
1997	50150	8850	59000	2000	61000
1998	50150	8850	59000	2000	61000
1999	50150	8850	59000	2000	61000

Fig. 23—Output screen for gains by type

LOSSES BY TYPE

Projection Year	Attrition	ETS Loss	Roll Up	Early Out	Palace Chase	Invol. Separ-ation	Retire-ment	Total
1988	25732	20581	0	0	2582	0	9647	58542
1989	25345	24417	0	0	2582	0	9094	61438
1990	24941	23095	0	0	2579	0	10082	60697
1991	24748	22832	0	0	2585	0	10655	60820
1992	24578	19529	0	0	2584	0	9800	56491
1993	24687	19207	0	0	2584	0	10992	57470
1994	24762	20381	0	0	2584	0	10843	58570
1995	24717	20777	0	0	2584	0	11395	59473
1996	24638	20590	0	0	2583	0	12196	60007
1997	24567	20324	0	0	2581	0	12050	59522
1998	24516	20122	0	0	2580	0	12151	59369
1999	24494	20008	0	0	2581	0	13089	60172

Fig. 24—Output screen for losses by type

POLICY-FREE ETS LOSSES

Projection Year	ETS Loss	Roll Up Shift	Early Out Shift	Palace Chase Shift	Policy-Free ETS Loss
1988	20581	0	2179	2519	25279
1989	24417	0	0	2681	27098
1990	23095	0	0	2809	25904
1991	22832	0	0	2742	25574
1992	19529	0	0	2400	21929
1993	19207	0	0	2486	21693
1994	20381	0	0	2625	23006
1995	20777	0	0	2607	23384
1996	20590	0	0	2585	23175
1997	20324	0	0	2590	22914
1998	20122	0	0	2581	22703
1999	20008	0	0	2583	22591

Fig. 25—Output screen for policy-free ETS losses

shows policy-free reenlistments, shifts (reenlistments that do not happen at a given time because the forced early reenlistment program made them happen earlier), early reenlistments, reenlistments at ETS, and total actual reenlistments.

The final Annual Inventory Projection Module output screen, Fig. 28, shows budget costs.

COMPUTER-AIDED DESIGN OF MANAGEMENT ACTIONS

Figures 29 through 33 present the input and output screens for the Computer-Aided Design of Management Actions Module. They accept user-specified inputs of end strengths and grade strengths and report estimates of the accessions and promotions that would be needed to achieve these goals.

One input screen, Fig. 29 is associated with the Computer-Aided Design of Management Actions option. This input screen displays the end strength and grade strength goals from the user-specified file. The output screens, Figs. 20 to 33, contain the results of a run of the Computer-Aided Design of Management Actions Module using the specified user-supplied goals. For illustrative purposes the basecase (default) goals and results are displayed in these figures.

FORCED EARLY REENLISTMENTS OUT OF: First Term

Projection Year	Policy-Free Reups	Early Reups Shifted To: SameFY	Early Reups Shifted To: PastFY	ETS Reups	Early Reups Shifted From: SameFY	Early Reups Shifted From: NextFY	Actual Reups
1988	24374	0	1000	23374	0	0	23374
1989	24991	0	0	24991	0	0	24991
1990	23344	0	0	23344	0	0	23344
1991	22232	0	0	22232	0	0	22232
1992	21293	0	0	21293	0	0	21293
1993	20764	0	0	20764	0	0	20764
1994	20395	0	0	20395	0	0	20395
1995	20386	0	0	20386	0	0	20386
1996	20378	0	0	20378	0	0	20378
1997	20365	0	0	20365	0	0	20365
1998	20357	0	0	20357	0	0	20357
1999	20350	0	0	20350	0	0	20350

(Repeated for first, second, and career terms)

Fig. 26—Output screen for reenlistments

REENLISTMENTS OUT BY CATEGORY OF ENLISTMENT

Projection Year	Category of Enlistment: First Term	Second Term	Career Term	Retirement Eligible Term	Total
1988	23979	14222	20023	3902	62126
1989	24849	16748	20606	4085	66288
1990	23287	17475	21280	4252	66294
1991	22231	15452	22157	4651	64491
1992	21290	9387	22558	4899	58134
1993	20763	11086	23133	4631	59613
1994	20397	14561	22966	4859	62783
1995	20385	15622	23719	4817	64543
1996	20376	15295	24263	4858	64792
1997	20366	14663	24255	4886	64170
1998	20356	14142	23964	4790	63252
1999	20349	13858	23804	4667	62678

Fig. 27—Output screen for forced early reenlistments out

BUDGET COSTS IN CONSTANT DOLLARS: (millions of FY87 dollars)

	MPA Budget						
Projection Year	Basic Pay	Retirement Pay	Other Pay	Bonus Pay	Training Cost	Severance Pay	Total
1988	6241.3	3193.0	3656.9	112.0	236.0	0.0	13439.4
1989	6255.3	3200.2	3653.2	120.5	236.0	0.0	13465.2
1990	6258.2	3201.7	3639.1	119.0	236.0	0.0	13454.0
1991	6249.1	3197.0	3621.5	114.0	236.0	0.0	13417.7
1992	6261.1	3203.2	3619.0	99.6	236.0	0.0	13419.0
1993	6293.0	3219.5	3630.3	102.5	236.0	0.0	13481.4
1994	6305.6	3225.9	3632.2	109.0	236.0	0.0	13508.7
1995	6301.6	3223.9	3625.5	110.7	236.0	0.0	13497.8
1996	6284.2	3215.0	3612.6	109.5	236.0	0.0	13457.4
1997	6264.9	3205.1	3599.5	108.0	236.0	0.0	13413.7
1998	6248.6	3196.8	3589.1	105.9	236.0	0.0	13376.6
1999	6225.9	3185.2	3576.1	104.5	236.0	0.0	13327.8

(Repeated for nominal dollars)

Fig. 28—Output screen for budget costs

Output Screens

The first output screen, shown in Fig. 30, gives the difference between the user-specified goals and the performance of the most recent plan examined using the Annual Inventory Projection Module.

The second output screen, shown in Fig. 31, gives the suggested plan of promotions and NPS accessions. There are two ways to implement this plan in the Annual Inventory Projection Module. The manual way is to enter the promotion flows on the Promotions to Grade Screen shown in Fig. 16 and the total NPS accessions column of the Accessions screen shown in Fig. 9. This can be done automatically, by selecting the Direct Map of Accessions and Promotions to IPM option in the Computer-Aided Design of Management Actions menu.

The last output screen for this module shows the additional promotions and NPS accessions (compared with the most recent plan examined using the Annual Inventory Projection module) that would be needed to meet the user-specified goals (see Fig. 32). This provides some insight into the feasibility of the goals.

GOALS FOR FORCE SIZE AT THE END OF EACH FISCAL YEAR
FOR THE TOP FIVE GRADES AND FOR THE TOTAL INVENTORY

Projection Year	Grade Strength E-5	E-6	E-7	E-8	E-9	End Strength
1988	113705	59000	38900	9700	4900	466000
1989	113700	59000	38900	9700	4900	466000
1990	113700	59000	38900	9700	4900	466000
1991	113700	59000	38900	9700	4900	466000
1992	113700	59000	38900	9700	4900	466000
1993	113700	59000	38900	9700	4900	466000
1994	113700	59000	38900	9700	4900	466000
1995	113700	59000	38900	9700	4900	466000
1996	113700	59000	38900	9700	4900	466000
1997	113700	59000	38900	9700	4900	466000
1998	113700	59000	38900	9700	4900	466000
1999	113700	59000	38900	9700	4900	466000

Fig. 29—Input screen for Computer-Aided Design Module

DIFFERENCE BETWEEN GOALS AND PERFORMANCE OF PLAN
CURRENTLY BEING TESTED
(Performance - Goal)

Projection Year	Grade Strength E-5	E-6	E-7	E-8	E-9	End Strength
1988	1451	743	153	59	-86	25243
1989	2254	1314	71	90	35	22032
1990	3376	1556	-487	10	131	19698
1991	4285	1626	-1256	-136	181	17026
1992	7298	2076	-1523	-224	111	19065
1993	10222	2000	-2193	-288	-40	20123
1994	11948	1908	-2797	-348	-132	19936
1995	13131	1539	-3531	-434	-153	18766
1996	14216	843	-4399	-592	-177	17103
1997	15388	200	-5075	-754	-206	15924
1998	16462	-539	-5454	-905	-313	14912
1999	17152	-1617	-6063	-1015	-398	13111

Fig. 30—Output screen for Computer-Aided Design Module:
Difference between goal and performance of plan

TOTAL PROMOTIONS AND NPS ACCESSION
REQUIRED TO ACHIEVE GOALS

Projection Year	Promotions into Grade					NPS Accessions
	E-5	E-6	E-7	E-8	E-9	
1988	17585	9734	7372	2528	1086	29648
1989	18308	9915	7417	2355	896	60363
1990	18825	10800	8010	2463	896	59097
1991	19522	11363	8412	2570	942	60992
1992	16722	10659	8083	2643	1033	49401
1993	17695	11696	8630	2726	1124	55918
1994	18710	11738	8649	2708	1100	56324
1995	19610	12235	8875	2695	1051	59418
1996	20342	12951	9250	2794	1058	57529
1997	20185	12929	9241	2839	1068	58138
1998	20239	12959	9133	2948	1157	57382
1999	21231	13676	9461	2940	1160	59979

Fig. 31—Output screen for Computer-Aided Design Module:
Total promotions and NPS accessions

ADDITIONAL PROMOTIONS AND NPS ACCESSIONS
REQUIRED TO ACHIEVE GOALS

Projection Year	Promotions into Grade					NPS Accessions
	E-5	E-6	E-7	E-8	E-9	
1988	-2320	-869	-126	27	86	-29352
1989	-1593	-686	-83	-145	-105	1363
1990	-1071	204	509	-38	-103	97
1991	-377	764	912	69	-75	1992
1992	-3173	63	585	142	31	-9599
1993	-2201	1097	1129	227	125	-3082
1994	-1187	1137	1150	210	102	-2676
1995	-290	1635	1375	196	50	418
1996	443	2348	1749	294	58	-1471
1997	286	2330	1740	339	68	-862
1998	337	2360	1634	447	156	-1618
1999	1332	3078	1961	437	160	979

Fig. 32—Output screen for Computer-Aided Design Module:
Additional promotions and NPS accessions

PLAN COMPARISON

The Comparison of Plans module is unique in that it does not have input screens. After selecting this module from the Main Menu, the user is prompted for the names of the two plans to be compared. The user then selects the type of comparison to be made (e.g., by grade, YOS, or total enlisted force) from the PLAN COMPARISON OPTIONS menu. There are 12 output screens; however, all of the output screens have the same format, so only one example of the output screens will be presented (Fig. 33).

Output Screens

The output screens display various chosen force structure comparisons of the two plans. They present summary comparative information for the named reference plan, named test plan, and the difference between them. Figure 33 shows the format of all output screens from the Comparison of Plans Module. The following is a list of the 12 summary measures, grouped by type of comparison:

By grade

- Grade E1–E3 ending inventory
- Grade E-4 ending inventory
- Grade E-5 ending inventory
- Grade E-6 ending inventory
- Grade E-7 ending inventory
- Grade E-8 ending inventory
- Grade E-9 ending inventory

By YOS

- Years of service range 0–4 ending inventory
- Years of service range 5–7 ending inventory
- Years of service range 8–11 ending inventory
- Years of service range 12+ ending inventory

Total enlisted force

- Total force ending inventory

SUMMARY PLAN COMPARISON FOR: Total Force

Projection Year	Reference	Test	DIFFERENCE (Reference - Test)
1988			
1989			
1990			
1991			
1992			
1993			
1994			
1995			
1996			
1997			
1998			
1999			

Fig. 33—Output screen for Plan Comparison Module

Appendix

SAMPLE REPORT OF MANAGEMENT ACTIONS AND RESULTS

The Save Results option in the View Inventory Projection Results/Program Options Menu (see Fig. 5), permits ADAM to save the management actions and results in a report format under a user-specified output file in the REPORT sub-directory. This appendix gives an example of the report generated by ADAM for the basecase scenario.

ADAM REPORT ON MANAGEMENT ACTIONS AND RESULTS
IN OUTPUT FILE: basecase

MANAGEMENT ACTIONS

	Economic Conditions			Accessions		
Year	Unempl	Milciv	CPI	TotalNPS	%TOE4	PS
1988	9.50	0.90	350.0	59000	85.0	2000
1989	9.50	0.90	350.0	59000	85.0	2000
1990	9.50	0.90	350.0	59000	85.0	2000
1991	9.50	0.90	350.0	59000	85.0	2000
1992	9.50	0.90	350.0	59000	85.0	2000
1993	9.50	0.90	350.0	59000	85.0	2000
1994	9.50	0.90	350.0	59000	85.0	2000
1995	9.50	0.90	350.0	59000	85.0	2000
1996	9.50	0.90	350.0	59000	85.0	2000
1997	9.50	0.90	350.0	59000	85.0	2000
1998	9.50	0.90	350.0	59000	85.0	2000
1999	9.50	0.90	350.0	59000	85.0	2000

NOTE: % of TOE4 = percent of NPS accessions with a 4-year term of enlistment.

Zone A Bonus Multiples

Year	0.5	1	2	3	4	5	6
1988	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1989	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1990	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1991	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1992	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1993	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1994	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1995	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1996	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1997	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1998	12.50	27.70	8.10	1.30	0.00	0.00	0.00
1999	12.50	27.70	8.10	1.30	0.00	0.00	0.00

Zone B Bonus Multiples

Year	0.5	1	2	3	4	5	6
1988	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1989	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1990	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1991	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1992	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1993	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1994	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1995	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1996	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1997	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1998	3.60	24.10	8.50	0.00	0.00	0.00	0.00
1999	3.60	24.10	8.50	0.00	0.00	0.00	0.00

Zone C Bonus Multiples

Year	0.5	1	2	3	4	5	6
1988	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1989	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1990	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1991	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1992	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1993	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1994	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1995	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Early Outs / Rollups / Involuntary Separations / Palace Chase Losses

Year	EOCAT1	EOCAT2	RUCAT1	RUCAT2	INSEP1	INSEP2	PC
1988	0	0	0	0	0	0	2582
1989	0	0	0	0	0	0	2582
1990	0	0	0	0	0	0	2582
1991	0	0	0	0	0	0	2582
1992	0	0	0	0	0	0	2582
1993	0	0	0	0	0	0	2582
1994	0	0	0	0	0	0	2582
1995	0	0	0	0	0	0	2582
1996	0	0	0	0	0	0	2582
1997	0	0	0	0	0	0	2582
1998	0	0	0	0	0	0	2582
1999	0	0	0	0	0	0	2582

Forced Early Reenlistments

	Same FY			Next FY		
Year	CAT1	CAT2	Career	CAT1	CAT2	Career
1988	0	0	0	0	0	0
1989	0	0	0	0	0	0
1990	0	0	0	0	0	0
1991	0	0	0	0	0	0
1992	0	0	0	0	0	0
1993	0	0	0	0	0	0
1994	0	0	0	0	0	0
1995	0	0	0	0	0	0
1996	0	0	0	0	0	0
1997	0	0	0	0	0	0
1998	0	0	0	0	0	0
1999	0	0	0	0	0	0

Promotions to Grade

Year	E-5	E-6	E-7	E-8	E-9
1988	19900	10600	7500	2500	1000
1989	19900	10600	7500	2500	1000
1990	19900	10600	7500	2500	1000
1991	19900	10600	7500	2500	1000
1992	19900	10600	7500	2500	1000
1993	19900	10600	7500	2500	1000
1994	19900	10600	7500	2500	1000
1995	19900	10600	7500	2500	1000
1996	19900	10600	7500	2500	1000
1997	19900	10600	7500	2500	1000
1998	19900	10600	7500	2500	1000
1999	19900	10600	7500	2500	1000

INVENTORY PROJECTION RESULTS

Ending Inventory by CATENL

Year	CAT1	CAT2	CAT3	CAT4	TOTAL	%2up
1988	210269	120097	138071	22806	491243	57.20
1989	200795	120500	143047	23690	488032	58.86
1990	194933	118553	146359	25853	485698	59.87
1991	191031	117018	147655	27322	483026	60.45
1992	189206	123405	146564	25890	485065	60.99
1993	188396	127428	143014	27285	486123	61.25
1994	188380	125790	144797	26969	485936	61.23
1995	188326	122589	146252	27599	484766	61.15
1996	188265	120081	146908	27849	483103	61.03
1997	188219	118562	147840	27303	481924	60.94
1998	188190	117836	148036	26850	480912	60.87
1999	188179	117504	146321	27107	479111	60.72

Ending Inventory by YOS

Year	0-3	4-7	8-11	12-15	16-19	20-24	25-29	TOTAL	%4up
1988	198040	108969	65642	51355	44431	18318	4488	491243	59.69
1989	185474	111910	69503	50520	46935	18920	4770	488032	62.00
1990	178250	112868	71711	51785	45231	21129	4724	485698	63.30
1991	174714	109480	73040	53286	45184	22665	4657	483026	63.83
1992	174678	105479	73582	56100	49336	21361	4529	485065	63.99
1993	174743	98763	77348	59515	48469	22456	4829	486123	64.05
1994	174789	95226	77678	61620	49654	21946	5023	485936	64.03
1995	174745	93604	74874	62919	51025	21987	5612	484766	63.95
1996	174688	93605	71703	61634	53624	22021	5828	483103	63.84
1997	174648	93608	67241	62324	56800	22049	5254	481924	63.76
1998	174627	93608	64810	62285	58732	21370	5480	480912	63.69
1999	174620	93579	63747	60174	59884	21925	5182	479111	63.55

Ending Inventory by GRADE

Year	E1-E3	E4	E5	E6	E7	E8	E9	TOTAL	%E5up
1988	140116	122607	115151	59743	39053	9759	4814	491243	46.52
1989	132885	125183	115954	60314	38971	9790	4935	488032	47.12
1990	130459	124453	117076	60556	38413	9710	5031	485698	47.52
1991	130314	121812	117985	60626	37644	9564	5081	483026	47.80
1992	130317	120810	120998	61076	37377	9476	5011	485065	48.23
1993	130383	119839	123922	61000	36707	9412	4860	486123	48.53
1994	130384	118773	125648	60908	36103	9352	4768	485936	48.73
1995	130350	117664	126831	60539	35369	9266	4747	484766	48.84
1996	130324	116688	127916	59843	34501	9108	4723	483103	48.87
1997	130307	115864	129088	59200	33825	8946	4694	481924	48.92
1998	130300	115161	130162	58461	33446	8795	4587	480912	48.96
1999	130299	114553	130852	57383	32837	8685	4502	479111	48.89

Average YOS Entering Each Grade

Year	E1-E3	E4	E5	E6	E7	E8	E9
1988	0.84	3.26	6.12	12.15	16.65	20.24	23.15
1989	0.83	3.24	6.06	12.20	16.71	20.16	23.18
1990	0.83	3.27	6.10	12.25	16.75	20.18	23.18
1991	0.83	3.29	6.23	12.34	16.78	20.28	23.1[illegible]
1992	0.83	3.25	6.42	12.49	16.87	20.37	23.24
1993	0.83	3.21	6.59	12.63	16.93	20.48	23.37
1994	0.83	3.21	6.67	12.82	17.02	20.55	23.54
1995	0.83	3.22	6.69	13.01	17.10	20.61	23.67
1996	0.83	3.22	6.68	13.19	17.16	20.62	23.73
1997	0.83	3.22	6.66	13.39	17.25	20.63	23.76
1998	0.83	3.23	6.64	13.58	17.36	20.68	23.72
1999	0.83	3.23	6.61	13.73	17.47	20.68	23.69

Average YOS in Each Grade

Year	E1-E3	E4	E5	E6	E7	E8	E9
1988	0.92	3.99	8.61	13.98	18.01	21.03	24.28
1989	0.89	4.09	8.82	14.13	18.14	21.19	24.56
1990	0.87	4.24	9.01	14.26	18.26	21.33	24.83
1991	0.87	4.36	9.21	14.38	18.37	21.47	25.04
1992	0.87	4.45	9.42	14.54	18.48	21.61	25.14
1993	0.87	4.49	9.64	14.67	18.57	21.77	25.15
1994	0.87	4.49	9.85	14.82	18.64	21.90	25.21
1995	0.87	4.47	10.04	14.97	18.71	22.01	25.33
1996	0.87	4.45	10.19	15.11	18.74	22.04	25.47
1997	0.87	4.43	10.32	15.26	18.78	22.05	25.59
1998	0.87	4.41	10.42	15.40	18.86	22.03	25.58
1999	0.87	4.40	10.48	15.52	18.92	22.02	25.57

Total Gains

Year	NPS-4	NPS-6	Total-NPS	PS	TOTAL
1988	50150	8850	59000	2000	61000
1989	50150	8850	59000	2000	61000
1990	50150	8850	59000	2000	61000
1991	50150	8850	59000	2000	61000
1992	50150	8850	59000	2000	61000
1993	50150	8850	59000	2000	61000
1994	50150	8850	59000	2000	61000
1995	50150	8850	59000	2000	61000
1996	50150	8850	59000	2000	61000
1997	50150	8850	59000	2000	61000
1998	50150	8850	59000	2000	61000
1999	50150	8850	59000	2000	61000

Total Losses

Year	Attrit	ETS	Rollup	EO	PC	Invol.	Retire	TOTAL
1988	25732	20843	0	0	2582	0	9647	58804
1989	25344	24529	0	0	2582	0	9094	61549
1990	24925	23118	0	0	2579		10083	60705
1991	24736	22805	0	0	2584	(	10654	60779
1992	24566	19508	0	0	2584	0	9800	56458
1993	24677	19188	0	0	2585	0	10992	57442
1994	24753	20324	0	0	2583	0	10843	58503
1995	24719	20767	0	0	2584	0	11393	59463
1996	24635	20581	0	0	2583	0	12194	59993
1997	24565	20318	0	0	2581	0	12047	59511
1998	24517	20117	0	0	2580	0	12149	59363
1999	24494	20004	0	0	2581	0	13081	60160

Policy Free ETS Losses

Year	ETS	Rollup	Earlyout	PC	PFETS
1988	20843	0	2179	2519	25541
1989	24529	0	0	2681	27210
1990	23118	0	0	2809	25927
1991	22805	0	0	2742	25547
1992	19508	0	0	2401	21909
1993	19188	0	0	2487	21675
1994	20324	0	0	2621	22945
1995	20767	0	0	2610	23377
1996	20581	0	0	2583	23164
1997	20318	0	0	2590	22908
1998	20117	0	0	2581	22698
1999	20004	0	0	2583	22587

Annual Reenlistments

Year	CAT1	CAT2	CAT3	CAT4	TOTAL
1988	23374	14171	19975	3902	61422
1989	24991	16770	20603	4085	66449
1990	23344	17482	21278	4252	66356
1991	22232	15462	22155	4651	64500
1992	21293	9395	22554	4899	58141
1993	20764	10953	23135	4631	59483
1994	20395	14421	22939	4859	62614
1995	20386	15640	23674	4817	64517
1996	20378	15311	24223	4859	64771
1997	20365	14679	24212	4889	64145
1998	20357	14146	23911	4790	63204
1999	20350	13867	23771	4667	62655

First Term Forced Early Reenlistments

Year	Policy-free Reup	Shifted to: SameFY	Shifted to: PastFY	ETS Reup	Shifted from: SameFY	Shifted from: NextFY	Total
1988	24374	0	1000	23374	0	0	23374
1989	24991	0	0	24991	0	0	24991
1990	23344	0	0	23344	0	0	23344
1991	22232	0	0	22232	0	0	22232
1992	21293	0	0	21293	0	0	21293
1993	20764	0	0	20764	0	0	20764
1994	20395	0	0	20395	0	0	20395
1995	20386	0	0	20386	0	0	20386
1996	20378	0	0	20378	0	0	20378
1997	20365	0	0	20365	0	0	20365
1998	20357	0	0	20357	0	0	20357
1999	20350	0	0	20350	0	0	20350

Second Term Forced Early Reenlistments

Year	Policy-free Reup	Shifted to: SameFY	Shifted to: PastFY	ETS Reup	Shifted from: SameFY	Shifted from: NextFY	Total
1988	14291	0	120	14171	0	0	14171
1989	16770	0	0	16770	0	0	16770
1990	17482	0	0	17482	0	0	17482
1991	15462	0	0	15462	0	0	15462
1992	9395	0	0	9395	0	0	9395
1993	10953	0	0	10953	0	0	10953
1994	14421	0	0	14421	0	0	14421
1995	15640	0	0	15640	0	0	15640
1996	15311	0	0	15311	0	0	15311
1997	14679	0	0	14679	0	0	14679
1998	14146	0	0	14146	0	0	14146
1999	13867	0	0	13867	0	0	13867

Career Term Forced Early Reenlistments

Year	Policy-free Reup	Shifted to: SameFY	Shifted to: PastFY	ETS Reup	Shifted from: SameFY	Shifted from: NextFY	Total
1988	23927	0	50	23877	0	0	23877
1989	24688	0	0	24688	0	0	24688
1990	25530	0	0	25530	0	0	25530
1991	26806	0	0	26806	0	0	26806
1992	27453	0	0	27453	0	0	27453
1993	27766	0	0	27766	0	0	27766
1994	27798	0	0	27798	0	0	27798
1995	28491	0	0	28491	0	0	28491
1996	29082	0	0	29082	0	0	29082
1997	29101	0	0	29101	0	0	29101
1998	28701	0	0	28701	0	0	28701
1999	28438	0	0	28438	0	0	28438

Annual Retentions Rates

Year	CAT1	CAT2	CAT3	Average
1988	53.49	74.89	98.09	70.63
1989	54.12	75.04	98.21	70.95
1990	54.15	75.50	98.12	71.90
1991	54.32	71.01	98.02	71.63
1992	54.38	73.11	97.90	72.63
1993	54.14	75.90	97.85	73.29
1994	54.34	73.54	97.81	73.18
1995	54.35	73.62	97.77	73.40
1996	54.33	74.10	97.71	73.66
1997	54.31	74.35	97.62	73.68
1998	54.30	74.46	97.57	73.58
1999	54.30	74.49	97.57	73.50

Budget Costs in Constant Dollars: (millions of FY87 dollars)

Year	Basic	Retire.	Other	Bonus	Training	Separat.	TOTAL
1988	6239.8	3192.3	3656.0	110.3	236.0	0.0	13434.4
1989	6251.5	3198.2	3650.9	120.9	236.0	0.0	13457.5
1990	6253.5	3199.3	3636.4	119.2	236.0	0.0	13444.3
1991	6244.5	3194.7	3618.9	114.1	236.0	0.0	13408.1
1992	6256.9	3201.0	3616.7	99.6	236.0	0.0	13410.2
1993	6289.1	3217.5	3628.2	102.2	236.0	0.0	13473.0
1994	6302.3	3224.2	3630.4	108.6	236.0	0.0	13501.5
1995	6298.7	3222.4	3624.0	110.7	236.0	0.0	13491.8
1996	6281.4	3213.6	3611.2	109.5	236.0	0.0	13451.7
1997	6262.3	3203.8	3598.2	108.1	236.0	0.0	13408.3
1998	6246.1	3195.5	3587.9	106.0	236.0	0.0	13371.4
1999	6223.4	3183.9	3574.8	104.6	236.0	0.0	13322.8

Budget Costs in Nominal Dollars: (millions of FY87 dollars)

Year	Basic	Retire.	Other	Bonus	Training	Separat.	TOTAL
1988	6238.0	3191.4	3655.0	110.3	235.9	0.0	13430.6
1989	6249.7	3197.3	3649.9	120.9	235.9	0.0	13453.6
1990	6251.7	3198.4	3635.4	119.1	235.9	0.0	13440.5
1991	6242.7	3193.8	3617.8	114.0	235.9	0.0	13404.3
1992	6255.1	3200.1	3615.6	99.6	235.9	0.0	13406.4
1993	6287.3	3216.6	3627.1	102.2	235.9	0.0	13469.2
1994	6300.5	3223.3	3629.3	108.6	235.9	0.0	13497.6
1995	6296.9	3221.5	3622.9	110.7	235.9	0.0	13488.0
1996	6279.6	3212.7	3610.2	109.5	235.9	0.0	13447.9
1997	6260.5	3202.9	3597.1	108.1	235.9	0.0	13404.5
1998	6244.3	3194.6	3586.8	105.9	235.9	0.0	13367.6
1999	6221.7	3183.0	3573.8	104.6	235.9	0.0	13319.0

REFERENCES

Carter, Grace M., Jan M. Chaiken, et al., *Conceptual Design of an Enlisted Force Management System for the Air Force*, The RAND Corporation, N-2005-AF, August 1983.

Carter, Grace M., Michael P. Murray, et al., *Middle-Term Loss Prediction Models for the Air Force's Enlisted Force Management System: Specification and Estimation*, The RAND Corporation, R-3482-AF, December 1987.

Cooke, John, Joseph DeSantis, et al., *C-Scape/Look and Feel*, Oakland Group, Inc., 1987.

Kernighan, Brian W., and Dennis M. Ritchie, *The C Programming Language*, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1978.

Mickelson, William T., and C. Peter Rydell, *Aggregate Dynamic Analysis Model (ADAM) for Air Force Enlisted Personnel: Technical Documentation*, The RAND Corporation, N-3020/2-AF, December 1989.

Walker, Warren E., "The Use of Screening in Policy Analysis," *Management Science*, Vol. 32, No. 4, April 1986, pp. 389–402.

Walker, Warren E., and Daniel McGary, *Supplementary Historical Data Files for the Enlisted Force Management System*, The RAND Corporation, N-2844-AF, March 1989.